



A.D. 1867, 23rd SEPTEMBER. N^o 2685.

S P E C I F I C A T I O N

OF

AUGUSTUS ZIEGELE.

MANUFACTURE OF EPSOM SALTS.

LONDON:

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A.D. 1867, 23rd SEPTEMBER. N° 2685.

Manufacture of Epsom Salts

LETTERS PATENT to Augustus Ziegele, of 11, Mincing Lane, in the City of London, for the Invention of "**IMPROVEMENTS IN THE MANUFACTURE OF EPSOM SALTS.**"—A communication from abroad by Messrs. Vorster and Grüneberg, residing at Cologne, in the Kingdom of Prussia.

Sealed the 21st February 1868, and dated the 23rd September 1867.

PROVISIONAL SPECIFICATION left by the said Augustus Ziegele at the Office of the Commissioners of Patents, with his Petition, on the 23rd September 1867.

I, **AUGUSTUS ZIEGELE**, of 11, Mincing Lane, in the City of London, do
5 hereby declare the nature of the said Invention for "**IMPROVEMENTS IN THE MANUFACTURE OF EPSOM SALTS,**" to be as follows:—

Epsom salts for medical and other purposes have hitherto been manufactured in England from magnesia, limestone, and dolomite by treating the same with sulphuric acid.

10 The Invention consists in manufacturing Epsom salts from the kiserit contained in the Stassfurt and Anhalt Abraum salt; also from the refuse obtained in the manufacture of muriate of potash in form of kiserit. For this purpose the kiserit containing Abraum salt or the before mentioned refuse is treated by cold water and washed, which manipulation carries off the soluble salts

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whilst the insoluble parts, as kiserit and anhydrate, remain in a settled state. This settled mass is washed once more with water, and in this manner cleaned from the adherent liquor, afterwards the mass is dried and ground and has become fit for use in cotton works, viz., for finishers, stiffeners, warp sizer, calenderers, calico printers, and others. The stuff can likewise be used in an undried and unground state. The kiserit thus obtained is treated by hot or cold water and dissolved by stirring it up from $\frac{1}{2}$ to 1 hour; by this operation it becomes hydrated, combined with water, and so transformed into Epsom salts. This dissolution after being cleared can be used either in cotton and other manufactories as above stated or evaporated and crystalized into Epsom salts. The kiserit can likewise be hydrated and dissolved by heat, and the Epsom salt crystalized direct out of the liquor. The above described proceeding is however preferable.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Augustus Ziegele in the Great Seal Patent Office on the 21st March 1868.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, AUGUSTUS ZIEGELE, of 11, Mincing Lane, in the City of London, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-third day of September, in the year of our Lord One thousand eight hundred and sixty-seven, in the thirty-first year of Her reign, did, for Herself, Her heirs, and successors, give and grant unto me, the said Augustus Ziegele, Her special licence that I, the said Augustus Ziegele, my executors, administrators, and assigns, or such others as I, the said Augustus Ziegele, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN THE MANUFACTURE OF EPSOM SALTS.**"—A communication to me from abroad by Messrs. Vorster and Grüneberg, persons resident at Cologne, in the Kingdom of Prussia, upon the condition (amongst others) that I, the said Augustus Ziegele, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office

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within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Augustus Ziegele, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

Epsom salts for medical and other purposes have hitherto been manufactured in England from magnesia, limestone, and dolomite by treating the same with sulphuric acid.

10 The Invention consists in manufacturing Epsom salts from the kiserit contained in the Stassfurt and Duhalt Abraum salts, also from the refuse obtained in the manufacture of muriate of potash in the form of kiserit. The Stassfurt Abraum salts and the refuse salts of the muriate of potash manufactory contain muriate of potash, of soda, of magnesia, anhydrit clay, sulphate of magnesia in varying proportions. The sulphate of magnesia is therein contained
15 in chemical combination with one equivalent of water ($\text{Mg. OSO}_3 + \text{HO}$) and is called as such kiserit, which is insoluble in cold water in its natural state. To obtain it in a pure form the above mentioned crude and refuse salts containing kiserit are put into flat fine sieves, these sieves are hung in tubs filled
20 with water and in consequence the water is in contact with the mass in the sieves. From the different materials contained in the salts only the soluble parts as muriate of potash, common salt (muriate of soda) and muriate of magnesia dissolve. The kiserit, of which there is about 16 % in the mass, however goes through the sieve in the form of fine crystal powder and collects at the bottom of
25 the tub like starch flour. As the soluble salts contained with the kiserit in the above mentioned crude salts and refuse salts dissolve, and the insoluble parts of the crude salts and refuse salts, viz^t. the anhydrit and clay, remain for their principal part in the sieve, I obtain on the bottom of the tub the kiserit in a nearly pure form. The kiserit thus obtained hardens very soon, a part of it
30 combining itself chemically with water, and in crystallizing cements the powder together. After having drawn off the salt liquor from the tub the kiserit is broken out from the bottom. The washing process may be otherwise conducted to separate the kiserit from the soluble and insoluble impurities, but the use of sieves in the manner described is preferred. The purified kiserit so
35 obtained is dried by strong calcination. By this calcination the kiserit pieces are transformed into a state about equal to burnt limestone, these pieces are ground very fine and stirred well in water, considerable heat is developed, and the material now dissolves very readily. By this operation it combines itself with 7 equivalent water and can therefore be crystallized as Epsom salts. The

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clear liquor obtained from the kiserit as aforesaid by stirring, and which is in fact a solution of Epson salts, is however also fit for direct use in the sizing, stiffening, finishing, etc., of all yarns and woven fabrics.

In witness whereof, I, the said Augustus Ziegele, have hereunto set my hand and seal, this Seventeenth day of March in the year of our Lord One thousand eight hundred and sixty-eight.

AUGUSTUS ZIEGELE. (L.S.)

LONDON:

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Printers to the Queen's most Excellent Majesty. 1868.